PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 :		(11) International Publication Number: WO 89/ 07434
A61J 1/00, B01F 3/12	A1	(43) International Publication Date: 24 August 1989 (24.08.89)

(21) International Application Number: PCT/SE89/00023

(22) International Filing Date: 27 January 1989 (27.01.89)

(31) Priority Application Number: 8800425-4

(32) Priority Date: 10 February 1988 (10.02.88)

(33) Priority Country: SE

(71)(72) Applicant and Inventor: WALLMARK, Kenneth [SE/SE]; S:t Eriks gata 7, S-392 46 Kalmar (SE).

(74) Agent: NYDELL, Peder; Nydells Patentbyrå, Storgatan 57, S-392 31 Kalmar (SE).

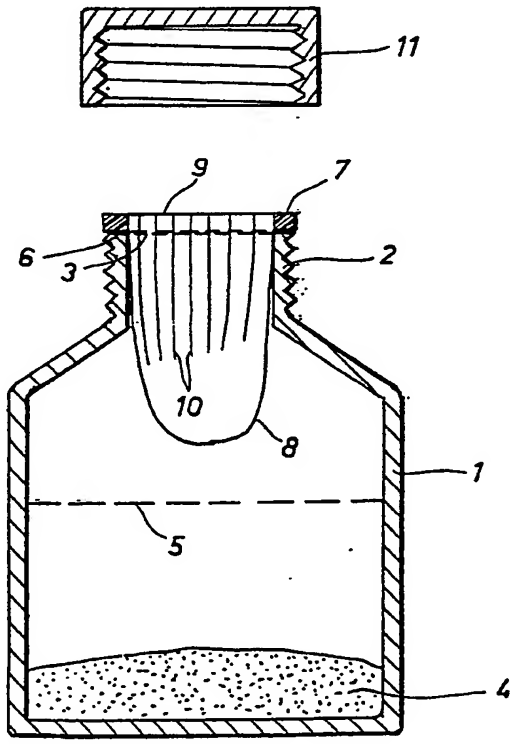
(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), NO, SE (European patent), US.

Published
With international search report.

(54) Title: A PROCESS OF MIXING A FLUID WITH A PULVERIZED SUBSTANCE AND A CONTAINER FOR CARRYING OUT THE PROCESS

(57) Abstract

The invention relates to a process of mixing a fluid with a pulverized substance which has tendency to emit dust when touched. The invention also relates to a container (1) for carrying out the process. According to the process the substance (4) is introduced into the container (1), whereafter the opening (3) of the container is covered by a filter (8). Then the fluid is introduced into the container through the filter (8). The filter (8), which is capable of permitting passage of the fluid but not the dust, has a vault extending into the opening (3) and consists suitably of a web of hairy or woolly threads (12, 13). The web (8) is suitably in the form of a bag, which extends a portion into the opening (3) of the container.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**FR**	France	**ML**	Mali
AU	Australia	**GA**	Gabon	**MR**	Mauritania
BB	Barbados	**GB**	United Kingdom	**MW**	Malawi
BE	Belgium	**HU**	Hungary	**NL**	Netherlands
BG	Bulgaria	**IT**	Italy	**NO**	Norway
BJ	Benin	**JP**	Japan	**RO**	Romania
BR	Brazil	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CF	Central African Republic			**SE**	Sweden
CG	Congo	**KR**	Republic of Korea	**SN**	Senegal
CH	Switzerland	**LI**	Liechtenstein	**SU**	Soviet Union
CM	Cameroon	**LK**	Sri Lanka	**TD**	Chad
DE	Germany, Federal Republic of	**LU**	Luxembourg	**TG**	Togo
DK	Denmark	**MC**	Monaco	**US**	United States of America
FI	Finland	**MG**	Madagascar		

A process of mixing a fluid with a pulverized substance and a container for carrying out the process

TECNICAL FIELD

The present invention relates to a process of mixing a fluid with a pulverized substance which has tendency to emit dust or powder when touched. The invention also relates to a container for carrying out the process.

PRIOR ART

Persons who carry out such mixing processes are often afflicted by dust that whirls up in the air when the fluid reaches the pulverized substance. A particular serious problem is the manual preparing of medical mixtures, both solutions and suspensions, for example water mixtures of antibiotic. Such mixtures, which are given to children because they have difficulty in swallowing tablets, have a durability of only two weeks, for which reason they cannot be prepared at the medical factory but have to be prepared at the drug-store each time. Therefore, the drug-store attendants are often susceptible to allergical problems due to the dust that whirls about in the air when the water is poured on the pulverized substance during the preparing of the mixture.

DISCLOSURE OF THE INVENTION

An object of the invention is, therefore, to provide a process and a container of the aforementioned kind, where no dust will whirl up towards the attendants. This object is achieved with a process and a container of the aforesaid kind having the characterizing features set forth in claims 1 and 3.

Further developments of the invention will be apparent

from the depending claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in more detail below with reference to the accompanying drawing, which illustrates a preferred embodiment of the invention.

Fig. 1 shows a longitudinal section of a container according to the invention. Fig. 2 shows a portion on an enlarged scale of a filter web which can be used in a filter in the container in accordance with Fig. 1.

PREFERRED EMBODIMENT

Fig. 1 shows an exemplifying container, namely a medical container in the form of a cylindrical glass bottle 1 having an externally screw-threaded cylindric neck 2, the circular opening 3 of which defines the only opening of the bottle 1. The container 1 is partially filled with a predetermined amount of a pulverized medical substance 4, for instance antibiotic in the form of penicillin, for instance. The container 1 is also intended to be partially filled with a predetermined amount of fluid, for example water, that is to be mixed with the medical substance 4, for instance up to a level 5.

Supported on the circular end edge 6 of the neck opening 3 is a holder ring 7, for example of a plastic, at which a filter 8 in the form a web or the like is secured, for example by means of a press-joint, along a free edge 9. The web 8 covers the opening 3 and forms a vault into the same, preferably in the form of a bag which extends at least a portion into the neck 2, or, as is shown in Fig.1, also a portion into the container 1. The bag 8 is provided with longitudinal pleats or gatherings 10, which in-

crease the filter surface.

A closure device in the form of an internally threaded cap 11 is designed to be threaded over the neck 2 thereby to also press the holder ring 7 like a sealing against the end edge 6 of the neck 2.

The material of the filter 8 consists suitably of a web of a fine net of threads or cords 12 and 13, see fig. 2, for instance textile threads of a nature material such as cotton or a synthetic material or a combination thereof. According to the embodiment shown in Fig. 2, the threads 12, 13 are hairy or woolly such that they form a gitter which is impermeable to dust, and which also contributes to the generation of a fluid film on the web 8 which prevents any passage of dust therethrough. The web is suitably made of a textile web of gauze bandage type.

The process according to the invention for mixing a fluid and a pulverized medical substance is carried out as follows.

A predetermined amount of the pulverized substance 4 is, preferably in a factory, caused to partially fill the container 1. The opening 3 of the container is then covered by the filter 8, which is thereby brought into its active position, whereafter the cap 11 is screw-tightened. The container 1 together with the predetermined amount 4 can now be transported to the drug-store where it is stored while waiting for any demand for a preparation of a mixture. When such a demand is present, the drug-store attendant unscrews the cap 11, whereupon the predetermined amount of fluid is introduced into the container 1 through the filter 8. Then the filter 8 is removed, i.e. it is brought to its inactive position, and the cap 11 is screw-tightened. The container 1 is shaked so

that the substance 4 and the fluid is carefully mixed. The mixture is now ready to be delivered to the patient.

The filter 8 may alternatively remain in the container while shaking the same.

When preparing mixtures which require a significant little amount of fluid it may occur that too high percentage of the fluid will be absorbed by the filter 8. This is readily compensated for by the introduction of correspondingly larger amount of fluid, suitably according to a fluid-compensation table.

C l a i m s

1. A process of mixing a fluid with a pulverized substance which has tendency to emit dust when touched, c h a r a c t e r i z e d in
a) causing the pulverized substance to partially fill a container having an opening,
b) covering the opening by a filter which is capable of permitting passage of said fluid but not said dust, and
c) introducing the fluid into the container through the filter and shaking the container so that the pulverized substance mixes with the fluid.

2. A process according to claim 1, c h a r a c t e - r i z e d in that the pulverized substance is a medical substance.

3. A container for carrying out the process according to claim 1, c h a r a c t e r i z e d in that the container (1) is only partially filled with said pulverized substance (4) in order to permit introduction of said fluid, the container having an opening (3) which is provided with a filter (8) which is capable of permitting passage of said fluid but not said dust, and the container being provided with a closure device (11) capable of closing the opening.

4. A container according to claim 3, c h a r a c t e - r i z e d in that the filter (8) forms a vault into the opening (3) to form a bag, which extends a portion into the container (1).

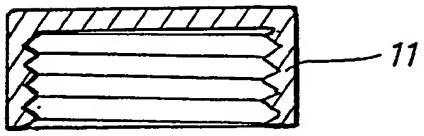
5. A container according to claim 4, c h a r a c t e - r i z e d in that the bag (8) is pleated to form an increased filter surface.

6. A container according to any of the claims 3 - 5, c h a r a c t e r i z e d in that the filter (8) consists

of a fine net of threads (12, 13).

7. A container according to claim 6, c h a r a c t e r i z e d in that the threads (12, 13) have certain hairiness and woolliness which obstructs said passage of dust.

8. A container according to any of the claims 3 - 7, c h a r a c t e r i z e d in that the filter (8) is attached to a holder ring (7) which like a sealing is loosely attachable over the opening (3).



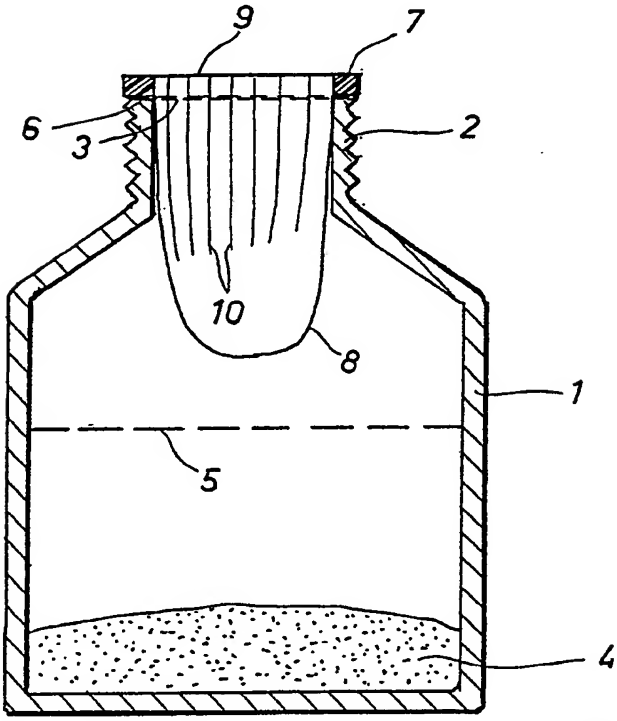


FIG. 1

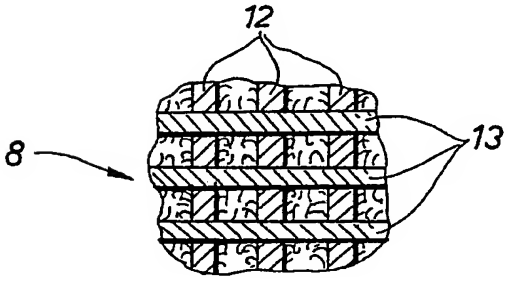


FIG. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 89/00023

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC [4]

A 61 J 1/00, B 01 F 3/12

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	A 61 J 1/00, 5/00; B 01 F 1/00, 3/00, /12, 15/00, /02; B 67 C 3/00, /02, /04, /22
US Cl.	128: 272.1; 141: 97, 98, 392; 206: 219; 215: 308; 604: 416

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	EP, A1, 0 033 374 (AGFA-GEVAERT AKTIENGESELLSCHAFT) 12 August 1981	

[10] Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1989-04-20	1989 -04- 25
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Wiva Asplund